## CLAIMS

1. An apparatus for processing an image, said apparatus comprising:

motion vector detection means for detecting a motion vector about a moving object that moves in multiple images, each of which is made up of multiple pixels and acquired by an image sensor having time integration effects, and tracking the moving object;

motion-blurring-mitigated object image generation means for generating a motion-blurring-mitigated object image in which motion blurring occurred in the moving object in each image of the multiple images is mitigated by using the motion vector detected by the motion vector detection means; and

output means for combining the motion-blurring-mitigated object image that is generated in the motion-blurring-mitigated object image generation means into a space-time location, in each image, corresponding to the motion vector, said motion vector being detected by the motion vector detection means, to output it as a motion-blurring-mitigated image.

2. The apparatus for processing the image according to claim 1, wherein the motion vector detection means sets a target pixel corresponding to a location of the moving object in any one of at least a first image and a second image, which are sequential in terms of time, and detects a motion vector corresponding to the target pixel by using the first and second images; and

wherein the output means combines the motion-blurring-mitigated object image into a location of the target pixel in said one of the images or a location corresponding to the target pixel in the

other image, said locations corresponding to the detected motion vector.

3. The apparatus for processing the image according to claim 1, wherein in a processing region of the image, the motion-blurring-mitigated object image generation means turns into a model so that a pixel value of each pixel in which no motion blurring corresponding to the moving object occur becomes a value obtained by integrating the pixel value in a time direction with the pixel being moved corresponding to the motion vector and generates a motion-blurring-mitigated object image in which motion blurring of the moving object included in the processing region is mitigated, based on the pixel value of the pixel in the processing region.

4. The apparatus for processing the image according to claim 3, wherein the motion-blurring-mitigated object image generation means includes:

region identification means for identifying a foreground region, a background region, and a mixed region in the processing region, said foreground region being composed of only a foreground object component constituting a foreground object which is moving object, said background region being composed of only a background object component constituting a background object, and said mixed region mixing the foreground object component and the background object component;

mixture ratio detection means for detecting a mixture ratio of the foreground object component and the background object component in the mixed region;

separation means for separating at least a part of region of the image into the foreground object and the background object, based on the mixture ratio; and

motion-blurring-adjusting means for mitigating motion blurring of the foreground object separated by the separation means based on the motion vector.

5. The apparatus for processing the image according to claim 3, wherein the motion vector detection means detects the motion vector every pixel in the image; and

wherein the motion-blurring-mitigated object image generation means sets the processing region according to the motion vector of the target pixel in the image so that the processing region includes the target pixel, and outputs pixel value in which motion blurring of the target pixel is mitigated in pixel units based on the motion vector of the target pixel.

6. The apparatus for processing the image according to claim 1, further comprising expanded image generation means for generating an expanded image based on the motion-blurring-mitigated image,

wherein the output means outputs the expanded image to a location corresponding to the motion vector in a time direction.

7. The apparatus for processing the image according to claim 6, wherein the expanded image generation means includes:

class determination means for extracting multiple pixels corresponding to a target pixel in the expanded image as a class tap from the motion-blurring-mitigated image and determining a class

corresponding to the target pixel based on a pixel value of the class tap;

storage means for storing predictive coefficients each for predicting a target pixel from multiple pixels in a first image, said multiple pixels corresponding to a target pixel in a second image, said predictive coefficients being obtained by learning between the first and second images every class, said first image having number of pixels corresponding to the motion-blurring-mitigated image, and said second image having number of pixels more than that of the first image; and

predictive value generation means for detecting the predictive coefficients each corresponding to the class detected by the class detection means from the storage means, extracting the multiple pixels corresponding to the target pixel in the expanded image as a predictive tap from the motion-blurring-mitigated image, and generating a predictive value corresponding to the target pixel according to one-dimensional linear combination of the predictive coefficients detected from the storage means and the predictive tap.

8. A method for processing an image, said method comprising:

motion-vector-detecting step of detecting a motion vector about a moving object that moves in multiple images, each of which is made up of multiple pixels and acquired by an image sensor having time integration effects, and tracking the moving object;

motion-blurring-mitigated-object-image-generating step of generating a motion-blurring-mitigated object image in which motion blurring occurred in the moving object in each image of the multiple images is mitigated by using the motion vector detected in the motion-vector-detecting step; and

output step of combining the motion-blurring-mitigated object image that is generated in the motion-blurring-mitigated-object-image-generating step into a space-time location, in each image, corresponding to the motion vector, said motion vector being detected in the motion-vector-detecting step, to output it as a motion-blurring-mitigated image.

9. The method for processing the image according to claim 8, wherein the motion-vector-detecting step sets a target pixel corresponding to a location of the moving object in any one of at least a first image and a second image, which are sequential in terms of time, and detects a motion vector corresponding to the target pixel by using the first and second images; and

wherein the output step combines the motion-blurring-mitigated object image into a location of the target pixel in said one of the images or a location corresponding to the target pixel in the other image, said locations corresponding to the detected motion vector.

10. The method for processing the image according to claim 8, wherein in a processing region of the image, the motion-blurring-mitigated-object-image-generating step turns into a model so that a pixel value of each pixel in which no motion blurring corresponding to the moving object occur becomes a value obtained by integrating the pixel value in a time direction with the pixel being moved corresponding to the motion vector and generates a motion-blurring-mitigated object image in which motion blurring of the moving object included in the processing region is mitigated, based on the pixel value of the pixel in the processing region.

11. The method for processing the image according to claim 10, wherein the motion-blurring-mitigated-object-image-generating step includes:

region identification step of identifying a foreground region, a background region, and a mixed region in the processing region, said foreground region being composed of only a foreground object component constituting a foreground object which is moving object, said background region being composed of only a background object component constituting a background object, and said mixed region mixing the foreground object component and the background object component;

mixture-ratio-detecting step of detecting a mixture ratio of the foreground object component and the background object component in the mixed region;

separation step of separating at least a part of region of the image into the foreground object and the background object, based on the mixture ratio; and

motion-blurring-adjusting step of mitigating motion blurring of the foreground object separated in the separation step based on the motion vector.

12. The method for processing the image according to claim 10, wherein the motion-vector-detecting step detects the motion vector every pixel in the image; and

wherein the motion-blurring-mitigated-object-image-generating step sets the processing region according to the motion vector of the target pixel in the image so that the processing region includes the target pixel, and outputs pixel value in which motion

blurring of the target pixel is mitigated in pixel units based on the motion vector of the target pixel.

13. The method for processing the image according to claim 8, further comprising expanded-image-generating step of generating an expanded image based on the motion-blurring-mitigated image,

wherein in the output step, the expanded image is output to a location corresponding to the motion vector in a time direction.

14. The method for processing the image according to claim 13, wherein the expanded-image-generating step includes:

class-determining step of extracting multiple pixels corresponding to a target pixel in the expanded image as a class tap from the motion-blurring-mitigated image and determining a class corresponding to the target pixel based on a pixel value of the class tap;

storing step of storing predictive coefficients each for predicting a target pixel from multiple pixels in a first image, said multiple pixels corresponding to a target pixel in a second image, said predictive coefficients being obtained by learning between the first and second images every class, said first image having number of pixels corresponding to the motion-blurring-mitigated image, and said second image having number of pixels more than that of the first image; and

predictive-value-generating step of detecting, in the storing step, the predictive coefficients each corresponding to the class detected in the class-detecting step, extracting the multiple pixels corresponding to the target pixel in the expanded image as a predictive tap from the motion-blurring-mitigated image, and generating a

predictive value corresponding to the target pixel according to one-dimensional linear combination of the predictive coefficients detected in the storing step and the predictive tap

15. A program for allowing a computer to perform the following steps:

motion-vector-detecting step of detecting a motion vector about a moving object that moves in multiple images, each of which is made up of multiple pixels and acquired by an image sensor having time integration effects, and tracking the moving object;

motion-blurring-mitigated-object-image-generating step of generating a motion-blurring-mitigated object image in which motion blurring occurred in the moving object in each image of the multiple images is mitigated by using the motion vector detected in the motion-vector-detecting step; and

output step of combining the motion-blurring-mitigated object image that is generated in the motion-blurring-mitigated-object-image-generating step into a space-time location, in each image, corresponding to the motion vector, said motion vector being detected in the motion-vector-detecting step, to output it as a motion-blurring-mitigated image.